APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,326	01/14/2002	Onur G. Guleryuz	AP121TP	7104

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EPSON RESEARCH AND DEVELOPMENT INC
INTELLECTUAL PROPERTY DEPT
150 RIVER OAKS PARKWAY, SUITE 225
SAN JOSE, CA 95134

EXAMINER
CHEN, PO WEI

ART UNIT	PAPER NUMBER
2676	

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
 Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
 earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *November 28, 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-10,12-18 and 20-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-10,12-18 and 20-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

In response to an Amendment received on November 28, 2003. This action is final.

Claims 1-2, 4-10, 12-18 and 20-24 are pending in this application. Claims 1, 9 and 17 are

independent claims.

The present title of the invention is "Fast Text/Graphics Resolution Improvement with Chain-

Code Table Look-Up".

The Group Art Unit of the Examiner case is now 2676. Please use the proper Art Unit number to

help us serve you better.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

2.   Claims 1, 8-9, 16-17 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Overton (US 5,537,495) in view of McCann et al. (US 4,777,651; refer to as McCann

herein).

3.   Regarding claim 1, Overton discloses a pixel correction and smoothing method

comprising:

A method for improving resolution of a digital representation having a plurality of text or

graphics pixels (lines 16-29 of column 2 and lines 50-52 of column 4);

Rendering the parameterized and smoothed boundary segment to improve the resolution

of the text or graphics object. (lines 19-56 of column 2 and lines 21-39 of column 8 and Fig. 2-

3).

Overton does not disclose identifying a pixel on a boundary of object of the digital

representation; and for each pixel identified as on the boundary, tracing a group of pixels,

including the initial boundary identified pixel, that constitute a local boundary segment and

constructing a chain-code indicative of the number and relative locations of the pixels of that

local boundary segment; parameterizing and smoothing that local boundary segment, resulting in

a new local boundary segment; accessing instructions stored in a look-up table for

parameterizing and smoothing that local boundary segment using the constructed chain-code as

an index to the look-up table. McCann discloses a method picture coding system utilizing the

method (lines 34-39 of column 2, lines 11-51 of column 6, lines 8-21 of column 8, lines 3-8 of

column 19 and lines 18-24 of column 20 and Tables I and II and Fig. 3-4 and 10-14; it is noted

that each edge or boundary contour is being identified using chain-code with starting pixel and

ending pixel. And each chain code indicates the number and relative locations of the pixels of

that boundary contour (lines 18-24 of column 20). Also, chain-code is used as an index to the

look-up table with operations instructions such as smoothing to determine a new value for the

pixels, thus corresponds to new contour. While claim recites parameterizing segment, the term is

broad enough to include the process where the contour being represented by window pixel data

(lines 11-51 of column 6)).

It would have been obvious to one of ordinary skill in the art at the time of invention to

substitute the image smoothing process of McCann for the image smoothing process of Overton

because McCann teaches that such image smoothing process will provide a totally automated image process system that is neither expensive or slow (lines 37-40 and lines 53-56 of column 1).

4.   Regarding claims 8, 16 and 24, statements presented above, with respect to claim 1 are incorporated.

5.   Regarding claims 9 and 17, statements presented above, with respect to claim 1 are incorporated.

6.   Claims 2, 4-5, 10, 12-13, 18 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Overton (US 5,537,495) and McCann (US 4,777,651; refer to as McCann herein) as applied to claims 1, 9 and 17 above, and further in view of Ohta (US 5,448,692).

7.   Regarding claim 2, the combination of Overton and McCann does not disclose the tracing step comprises searching and identifying each new pixel in the group with respect to a background neighbor pixel that is propagated from a penultimate-identified pixel to a just-identified pixel.

Ohta discloses a digital image processing device utilize the method (lines 49-68 of column 9 and lines 1-29 of column 10 and Fig. 15-17; surrounding white pixel corresponds to background neighbor pixel and the tracing is done by shifting from previous identified pixel to the pixel just been found). It would have been obvious to one of ordinary skill in the art at the time of invention to substitute the contour tracing with chain code of Ohta for the contour tracing with chain code of McCann because Ohta teaches that such contour tracing would provide the advantage of effecting digital image processing with a desired area without damaging the image (lines 56-60 of column 1, Ohta).

8.   Regarding claim 4, the combination of Overton and McCann does not disclose the tracing

step comprises identifying first and second contiguous sub-groups of pixels, each starting with

the initial pixel and extending in first and second directions respectively relative to propagated

background neighbor pixel and, if available, a just-identified pixel in that sub-group to construct

the chain-code.

Ohta discloses a digital image processing device utilize the method (lines 35-68 of

column 9 and lines 1-29 of column 10 and Fig. 15-17). It would have been obvious to one of

ordinary skill in the art at the time of invention to substitute the contour tracing with chain code

of Ohta for the contour tracing with chain code of McCann because Ohta teaches that such

contour tracing would provide the advantage of effecting digital image processing with a desired

area without damaging the image (lines 56-60 of column 1, Ohta).

9.   Regarding claim 5, as statement presented above, with respect to claim 4 are

incorporated. Also, it is noted that depending on inner or outer contour, the tracing direction is

different and 8 pixels, which surround the starting pixel, are traced and assigned with chain code

in accordance with the pre-determined set of rules such as traces inner or outer contour lines

depending on the tracing directions.

10.   Regarding claims 10, 12-13, 18 and 20-21, statements presented above, with respect to

claims 2 and 4-5 are incorporated.

11.   Claims 6-7, 14-15 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Overton (US 5,537,495), McCann (US 4,777,651; refer to as McCann herein) and Ohta (US

5,448,692) as applied to claims 1, 9 and 17 above, and further in view of Pearson et al. (US

4,528,693; refer to as Pearson herein).

12.   Regarding claim 6, Overton does not disclose the instructions on parameterizing and

smoothing stored in pre-computed look-up table, indexed by the corresponding chain-code.

However, this is known in the art taught by McCann, as statements presented above, with respect

to claim 1 above are incorporated herein. The combination of Overton, McCann and Ohta does

not disclose a differential stored and the differential representing a difference between the

location of at least one pixel in the new segment and the location of that pixel in the

corresponding unprocessed segment. Pearson discloses a method for scaling image data utilize

this method (lines 1-15 of abstract and lines 5-18 of column 4 and Fig. 1-3). It would have been

obvious to one of ordinary skill in the art at the time of invention to utilize the teaching of

Pearson to provide the advantage of converting image to different size with minimum loss of

information and with increased speed (lines 62-64 of column 1, Pearson). Also, both Overton

and Pearson are directed to changing accuracy of subpixels.

13.   Regarding claim 7, as statements presented above, with respect to claim 6 are

incorporated.

14.   Regarding claims 14-15, as statements presented above, with respect to claims 6-7 and 8

are incorporated.

15.   Regarding claims 22-23, as statements presented above, with respect to claims 6-7 and 8

are incorporated.

Response to Arguments

16.   Applicant's arguments with respect to claims 1-2, 4-10, 12-18 and 20-24 have been

considered but are moot in view of the new ground(s) of rejection.

The Applicant argues references do not disclose identifying boundary pixel, a group of pixels is traced, including the initial boundary pixel, that constitute a local boundary segment, and a chain code is constructed for that local boundary segment. The chain-code is indicative of the number and relative locations of the pixels of that segment. The segment is then parameterized and smoothed, resulting in a new local boundary segment by accessing instructions stored in a look-up table (LUT) using the constructed chain-code as an index to the LUT. However, this is known in the art taught by McCann (lines 34-39 of column 2, lines 11-51 of column 6, lines 8-21 of column 8, lines 3-8 of column 19 and lines 18-24 of column 20 and Tables I and II and Fig. 3-4 and 10-14; it is noted that each edge or boundary contour is being identified using chain-code with starting pixel and ending pixel. And each chain code indicates the number and relative locations of the pixels of that boundary contour (lines 18-24 of column 20). Also, chain-code is used as an index to the look-up table with operations instructions such as smoothing to determine a new value for the pixels, thus corresponds to new contour. While claim recites parameterizing segment, the term is broad enough to include the process where the contour being represented by window pixel data (lines 11-51 of column 6)).

Conclusion

17.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this
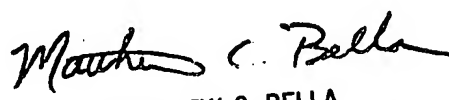
final action.

Inquiry

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Po-Wei (Dennis) Chen whose telephone number is (703) 305-

8365. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew C Bella can be reached on (703) 308-6829. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-3900.

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Po-Wei (Dennis) Chen
Examiner
Art Unit 2676

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Po-Wei (Dennis) Chen
February 13, 2004

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600